

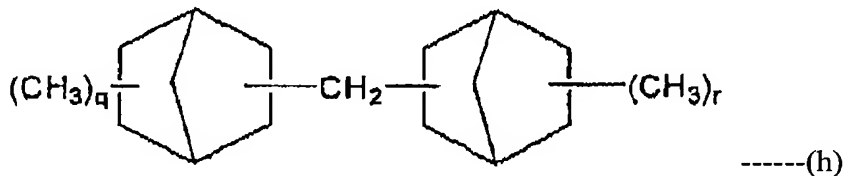
REMARKS/ARGUMENTS

The amendment to Claim 9 is supported by Claims 10, 11 and 12. The amendments to Claims 13 and 22 are supported by these claims as originally filed. New Claims 23-34 are supported by original Claims 9 and 10. No new matter has been entered.

Applicants appreciate the reconsideration and withdrawal of the previous rejections.

The above amendment limiting the claims to the subject matter of previous Claims 10-12 substantially reduces the issues remaining in this case. In particular, the rejections at paragraphs 3, 4 and 8 of the outstanding Official Action are no longer applicable as none of these rejections were applied against any of Claims 10-12. The only remaining rejection, presented at paragraph 7 of the Official Action, of Claims 10-12 as obvious over Vojacek in view of Wygant is traversed.

As recognized in the rejection itself, Vojacek does not disclose a synthetic traction base oil having an ally cyclic structure represented by formula (h):



Wygant, cited as making up for that lacking in Vojacek, is characterized as disclosing base oils including 2,4-dicyclohexyl-2-methylpentane and 2,3-dicyclohexyl-2,3-dimethylbutane.

In the first instance, none of the compounds described in Wygant contain a norbornane skeleton as required by formula (h) in Claim 10. The compound of formula (h) contains two bridged bicyclic compounds of the general formula:

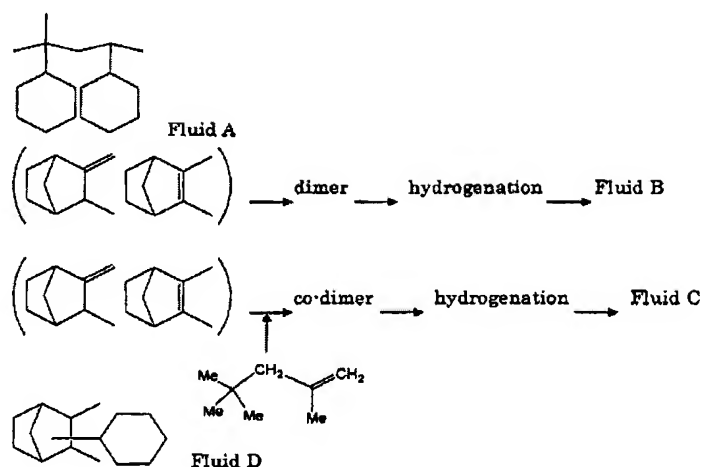


which is nowhere disclosed or suggested by Wygant.

With regard to generic Claim 9 and Claims 11-12, Wygant does disclose 2,4-dicyclohexyl-2-methylpentane and 2,3-dicyclohexyl-2,3-dimethylbutane at column 3, lines 1-4. However, these compounds are listed simply as two species among many, many cyclohexyl compounds described as potentially useful in Wygant, the list thereof beginning at column 2, lines 47. There is no preference in Wygant for these specific materials, nor are they used in the Examples of the reference.

Moreover, the compositions of amended Claims 9, 11 and 12 exhibit unexpectedly superior properties such as a high-temperature traction coefficient, good low-temperature viscosity, and a high viscosity index. While each of these properties is important to a lubricating oil for continuously variable transmissions, for example, the presently claimed composition provides a unique material that is satisfactory in all of these properties simultaneously. Vojacek and Wygant do not teach or suggest such unexpectedly superior, highly-balanced properties for the claimed compositions.

These unexpectedly superior, highly-balanced properties of the presently claimed compositions have been shown in the Examples and Comparative Examples of record in the present specification, filed under original Declaration. In order to ease understanding of these examples, the structures and the properties of fluids A to D which are used in the Examples and Comparative Examples in the present specification are shown below:



Fluid A: 2,4-dicyclohexyl-2-methylpentane

Fluid B: hydrogenation product of dimer obtained by the reaction using dehydration products of 2-hydroxymethyl-3-methylbicyclo[2.2.1]heptane

Fluid C: hydrogenation product of codimer obtained by the reaction of dehydration products of 2-hydroxymethyl-3-methylbicyclo[2.2.1]heptane with diisobutylene

Fluid D: cyclohexyl-dimethylbicyclo[2.2.1]heptane

As shown in Table 1 below, compiled from the specification, while Fluid A and B have, on their own, a high traction coefficient, they do not have good viscosity-properties (Claim 9 requires a viscosity of -40°C of 40 Pa·s or less and a viscosity index of 80 or more). Although Fluid C has a low-40°C viscosity and a high viscosity index, the traction coefficient in Fluid C is very low. Fluid D is a balanced fluid, but it has no noteworthy properties.

Table 1

	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3	Comp. Ex. 5
	Fluid A	Fluid B	Fluid C	Fluid D
K. V. @ 40°C (mm ² /s)	20.23	17.32	6.535	7.034
K.V. @ 100°C (mm ² /s)	3.572	3.578	2.038	2.002
Viscosity index	13	77	103	61
Pour point (°C)	-42.5>	-50>	-50>	-50>
-40°C viscosity (Pa·s)	256	55	1>	3.5
Density g/cm ³	0.9009	0.9544	0.8713	0.9242
Traction coefficient	0.082	0.086	0.057	0.074

The lubricating oil compositions of the present invention use a specific combination of specific fluids and, as shown in Table 2 below, provide a superior lubricating oil composition suitable for CVT as a result of Applicants' unique combination.

Table 2

	Examples		Comp. Examples		Examples	
	2	5	4	6	3	6
Fluids	Fluid 1	Fluid 2	Fluid C	Fluid D	Fluid 1	Fluid 2
	Fluid A	Fluid A	Fluid A	Fluid A	Fluid B	Fluid B
K. V. @ 40°C (mm ² /s)	12.68	10.93	10.82	11.49	14.70	13.78
K.V. @ 100°C (mm ² /s)	2.986	2.778	0.639	2.634	3.315	3.212
Viscosity index	81	93	64	38	90	95
Pour point (°C)	-50>	-50>	-50>	-50>	-50>	-50>
-40°C viscosity (Pa·s)	4	2	3	15	15	3
Density g/cm ³	0.9131	0.9173	0.8859	0.9124	0.9485	0.9503
Traction coefficient	0.079	0.072	0.069	0.078	0.085	0.081

When Fluid 1 or 2 (see specification pages 16-18 for the structure of Fluids 1 and 2) is mixed with Fluid A or B, lubricating oil compositions having highly-balanced, excellent properties are obtained (Ex. 2, 3, 5 and 6). However, such lubricating oil compositions are not obtained using Fluids C and D (Comp. Ex. 4 and 6) even though Fluids C and D contain a

bicyclo[2.2.1]heptane (i.e., a norbornane) structure. Fluids 3 to 15 also show lubricating oil composition having highly balanced properties, as shown in Tables 3-1 and 3-2.

Table 3-1

	Examples						
	8	10	12	14	16	18	20
Fluids	Fluid 3	Fluid 4	Fluid 5	Fluid 6	Fluid 7	Fluid 8	Fluid 9
	Fluid B	Fluid B	Fluid B	Fluid B	Fluid B	Fluid B	Fluid B
K. V. @ 40°C (mm ² /s)	12.63	13.36	13.72	15.25	19.26	14.07	13.69
K.V. @ 100°C (mm ² /s)	3.016	3.106	3.169	3.458	3.115	3.231	3.193
Viscosity index	89	86	88	102	91	91	94
Pour point (°C)	-50>	-50>	-50>	-50>	-50>	-50>	-50>
-40°C viscosity (Pa·s)	4	5	6	11	4	8	4
Density g/cm ³	0.9478	0.9521	0.9488	0.9585	0.9508	0.9481	0.9511
Traction coefficient	0.081	0.082	0.081	0.083	0.081	0.082	0.078

Table 3-2

	Examples					
	22	24	26	28	30	32
Fluids	Fluid 10	Fluid 11	Fluid 12	Fluid 13	Fluid 14	Fluid 15
	Fluid B	Fluid B	Fluid B	Fluid B	Fluid B	Fluid B
K. V. @ 40°C (mm ² /s)	14.91	13.57	12.66	14.74	14.70	15.44
K.V. @ 100°C (mm ² /s)	3.35	2.28	2.977	3.306	3.302	3.481
Viscosity index	92	81	80	88	88	101
Pour point (°C)	-50>	-50>	-50>	-45	-45	-45
-40°C viscosity (Pa·s)	14	9	2	15	15	14
Density g/cm ³	0.9527	0.9663	0.9634	0.9891	0.9796	1.02
Traction coefficient	0.082	0.081	0.079	0.079	0.081	0.083

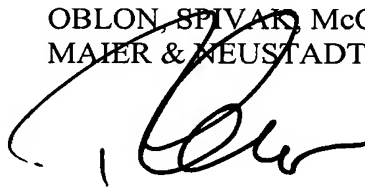
As shown in Comparative Examples 4 and 6, and in all of the Examples and Comparative Examples above, Applicants' specific combination of 1.) a compound represented by general formulae (a) to (f) with 2.) a synthetic traction base oil which is selected from the group consisting of a hydrocarbon represented by the formula (h), 2,4-dicyclohexyl-2-methylpentane, and 2,3-dicyclohexyl-2,3-dimethylbutane provides lubricating oil compositions that exhibit highly-balanced properties of high-temperature traction, low-temperature viscosity, and viscosity index. These properties are unexpected in view of the

combined disclosure in Vojacek and Wygant, which importantly omits the disclosure of the synthetic traction base oil which is represented by formula (h) (see Claims 10 and 29-34), and which nowhere suggests the possibility of such highly balanced properties over those obtained using similar materials that are outside the scope of the pending claims.

Accordingly, and in view of the above, Applicants respectfully submit that the present application is patentable over the disclosure of Vojacek and Wygant, and request the reconsideration and withdrawal of this rejection and the passage of this case to Issue.

Respectfully submitted,

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